

ommendations for a state energy policy, completed its work in 1992. This Commission noted that the state's energy policy should address the cost, reliability, environmental impact, and economic impact of energy projects. It stated that the goal of the state's energy policy should be to meet the state's energy needs with reliable energy supplies

at the lowest possible cost, while at the same time ensuring that energy production is consistent with Maine's goals for a healthy environment and a vibrant economy. The Land Use Regulation Commission supports this goal and will try to advance it in its review of potential energy projects.

Forest Resources

Proportionately, Maine is the most heavily forested state in the nation, with 89% of its land area in forest. The Commission's jurisdiction is nearly 95% forested, making it even more extensively wooded than the state as a whole. The vastness of this forest resource contributes to the impression of the North Woods as a wild and remote place, one of the area's most distinctive characteristics. The forests offer a variety of opportunities and values, including timber harvesting, recreation, energy production, wildlife habitat, and watershed protection.

Maine's forest resources are vitally important to the state and New England – economically, culturally, and biologically. Economically, forest resources have supplied a continuous stream of raw materials for lumber, pulp, and paper production which have provided a stable economic base throughout the state's history. Today, this primary production remains a bulwark of the state's economy, increasingly supplemented by forest-based recreational industries. Culturally, the seemingly endless expanse of the forest is an integral part of Maine's heritage, a place where residents have earned their livelihoods, hunted and fished for both food and sport, and explored and recreated, alongside visitors "from away." Biologically, the forests provide genetic and ecosystem diversity, natural systems for counteracting air and water pollution, animal and plant habitats, and many other values.

Characteristics

The composition of Maine's forests is heavily influenced by three factors: extensive areas of thin, rocky, and poorly drained soils, intermixed with scattered areas of deeper, better-drained soils; a cool climate and abundant precipitation; and recurrent insect outbreaks. Situated between the

eastern boreal forest and the temperate deciduous forest, much of Maine lies in an ecological transitional zone referred to as the Acadian forest. A mixture of hardwoods and softwoods comprise the forest, changing in composition as one moves to higher elevations and north and east. The sub-boreal Acadian forest occurs more in northern and eastern portions of the state and tends to be dominated by spruce, fir and other softwoods.

Maine is endowed with approximately 17.6 million acres of forestland statewide; 17.1 million acres are considered timberland and the other half million acres are in parks and wildlife preserves. Softwoods comprise approximately 7.8 million acres of woodland; hardwoods, 6.7 million acres; and mixed woods, 3.1 million acres. The principal softwoods found in Maine are spruce, fir, white pine, cedar, tamarack, and hemlock; the principal hardwoods are maple, birch, beech, oak, ash, and aspen. LURC's jurisdiction encompasses over half of the forestland in Maine, 9.5 million acres, and includes much of the state's spruce-fir forest.

Most of the information about Maine's forest resources comes from inventories that assess the nation's wood supply, conducted by the U.S. Forest Service. The federal agency completed the most recent federal inventory in 1980, and another is underway with the results due in 1996. To fill in the gap, the Maine Forest Service (MFS) undertook an assessment of Maine's wood supply and published its findings in 1993.

Compared with the results of past surveys, MFS's Assessment found a decline in the growing stock volumes of spruce and fir. (Growing stock is defined by MFS as larger trees, 5 inches diameter at breast height or more, of sufficiently high quality that 50% of the tree can be used for pulpwood or a higher value product.) MFS attributes much of this decline to mortality and reduced growth rates

associated with budworm damage and harvest rates. The growing stock volumes of other softwoods, principally hemlock, white pine, and cedar, are stable or increasing. According to the Assessment, the quality of the softwood resource has improved based on the percentage of potential sawlog wood that is actually sawlog quality.

3

The spruce budworm has had a major impact on the forest over the past century, recurring cyclically every 60 or so years, concurrent with the maturation of large volumes of balsam fir. The forest resource was affected by a major outbreak of spruce budworm which lasted from the early 1970's to the mid-1980's. This outbreak damaged or killed millions of trees, prompting premature harvest of many stands. The forest is still recovering to pre-outbreak rates of growth. As a result of this and prior outbreaks, the spruce fir forest demonstrates an age-class imbalance. Young trees of these species are abundant, but larger trees will be scarcer for the next 20 or so years.

Hardwood growing stock volumes have generally remained stable since inventories were first begun 30 years ago. However, MFS's Assessment indicates a decline in the quality of the hardwood resource since the 1960's and suggests that high grading – the practice of removing only the best trees and leaving lower quality trees behind – may be the cause.

Ownership

Maine has the largest proportion of industrial forestland ownership of any state in the nation. Statewide, nearly 95% of the forestland is privately owned, with land management and pulp and paper companies owning and controlling a large portion of it. Most of the industrial forestland ownership in the state is within the Commission's jurisdiction.

Industrial owners generally own forestland and wood processing facilities, usually pulp mills or sawmills. Nonindustrial owners usually manage land for timber but do not own wood processing facilities. Small, nonindustrial owners generally do not manage their land as a full-time endeavor.

Information from the Maine State Bureau of Taxation on ownership patterns in the unorganized townships is shown in the following table. The 40 plantations and organized towns within LURC jurisdiction, for which statistics on ownership are not readily available, generally have more landowners and more fragmented ownership patterns than

unorganized townships. Therefore, the figures for all of LURC jurisdiction are likely to be considerably higher, particularly in the smaller categories of ownership.

It is estimated that, for townships whose status has not changed since 1971 (for example, by organizing to a plantation or town form of government, or conversely, deorganizing), the number of landowners with landholdings less than 500 acres in size has increased from 5,500 to approximately 8,400 – a 53% increase.

Leasing of land is a common practice in the jurisdiction and is not reflected in the above numbers. Leases are most commonly used for relatively small recreational lots. Approximately 5,600 leases were held in the unorganized townships in 1991.

Forest Use

Traditionally, Maine's forests have supported wood products industries that are vital to the economies of surrounding communities as well as the state, and provided the environment for many nontimber, forest-based activities, such as recreation. The past two decades have seen increasing diversity in the use and value of Maine's forest resources, as well as growing intensity of use. The forest industry, the dominant landowner and user of the forest resource, and some other industries have contributed to this trend through more intensive forest management, increased use of hardwoods, construction of biomass plants, and evaluation of lands for purposes other than timber production, such as windpower, mining, and other forms of resource development. Concurrently, the forest resource has experienced increasing use for recreation, including a number of new forms of recreation, and growing interest in its biodiversity.

Forest Industry

Timber harvesting, originally for lumber, and later for pulp and paper production, has long been the major use of Maine's forest. Today, the forest provides raw material for pulp and paper, lumber, and other forest products, and the forest industry is the largest single contributor to Maine's economy. Wood is typically harvested by independent logging contractors and used by one of the following: the paper industry, comprised of a small number of large companies; the lumber industry, comprised of a large number of small firms; or by wood products manufacturing entities, of which there are 200 to 300 in the state. Forest products constitutes 44%

LANDOWNERSHIP IN UNORGANIZED TOWNSHIPS -1991

Size of ownership	No. of Landowners	No. of Parcels	Total acreage
< 1 ac.	3,519	4,474	2,247
> 1 - 10 ac.	2,769	3,439	11,946
> 10 - <40 ac.	1,092	1,517	33,423
40 - <500 ac.	1,926	2,674	287,026
500 - 1,000 ac.	67	241	178,340
> 1,000 - < 5,000 ac.	63	242	591,062
> 5,000 ac.	68	533	8,098,784
TOTAL	9,504	13,120	9,202,828

Source: Maine State Bureau of Taxation data; compiled by LURC staff.

- Notes:
- (1) Does not include ownership data for plantations and towns in LURC jurisdiction;
 - (2) Does not reflect the approximately 5,600 leases in these areas.
 - (3) Bureau of Taxation practice of combining contiguous parcels in the same ownership may under-represent the number of parcels.
 - (4) The practice of holding land in common, undivided ownerships may result in some overrepresentation of the number of landowners and the number of parcels, principally in the larger acreage categories.

of the total value of all products manufactured in the state. Paper, lumber, and wood products industries employ 8% of all Maine workers, but account for 35% of total payroll in the state, making it clear that a vigorous and healthy forest contributes significantly to the well-being of Maine's economy. The forest products economy relies heavily upon wood coming from areas within LURC jurisdiction.

Spruce and fir dominated the forest products industry for years, but their importance as measured in terms of percentage of the harvest has decreased. Starting in the 1980's, there has been a major shift away from use of spruce and fir and toward hardwood as a source of pulpwood. Today, more hardwood than softwood is harvested in Maine to make paper. The decline in use of spruce and fir pulpwood is attributed to its rising cost and concerns over its long-term supply. Sawlog production of spruce and fir has expanded, but overall harvest levels have dropped concurrent with significant increases in the use of other species.

Trees of sawlog size will become scarcer for the next 20 or so years. This shortage has been predicted for some time, although its specific length and severity remain uncertain. The declining use of softwood in pulp production and increased management of young spruce and fir stands to improve productivity may help to alleviate future shortfalls.

While utilization of hardwood has increased, the management difficulty remains the lack of regional pulpwood markets. Without markets for low-quality hardwood, hardwood quality may continue to decline if low-quality trees are left in the woods.

In the 1980's, biomass energy emerged as a new use of wood. Wood-using industries have traditionally used waste wood to generate heat or steam, but not on a large scale. No biomass facilities are located in LURC jurisdiction, but many are adjacent and utilize wood from the jurisdiction. In 1990, these plants consumed four million tons of wood fuel, 40% of which was mill residue. The



Harvesting near Trout Pond

remaining 60% was generated by integrated logging jobs and came from harvest residues, poor quality hardwood, noncommercial species, and products of pre-commercial thinnings.

Establishment of Forest Practices legislation in 1990, administered by the Maine Forest Service, has affected use of the forest. The original legislation provided for increased technical assistance to forest landowners, establishment of a clearinghouse for information about forest management, improved forest management activity reporting, and development of rules regarding forest regeneration and clearcutting. The increased technical assistance, however, was never provided due to lack of funding. The rules enable better tracking of forest utilization by requiring notification of intent to harvest commercial forest products for sale and reporting of products (volume) harvested. They also establish standards pertaining to clearcutting and regeneration. The rules define clearcuts based on basal area per acre of trees of acceptable quality and species and regeneration standards. Areas of nonclearcut land must be left adjacent to clearcut land, the specific standards varying

based on clearcut size. Clearcuts as defined in the law are prohibited.

Maine's forest resources may be affected by nationwide changes in wood supply and demand. Reduced harvest levels in the Northwest may precipitate increased demand for wood from the northeast. This trend may be further accentuated if the U.S. Forest Service decides to eliminate below cost timber sales on National Forestland.

In the foreseeable future, timber production will continue to be the most significant economic use of the forest resource in the jurisdiction, but other uses continue to be explored. A number of new uses of the forestland base have surfaced in the past decade, such as windpower and mining. The value of land for development has also increased, particularly near shorelines and scenic places, due to heightened demand for recreational homes.

Recreation

Recreation has long been a common and popular use of the Maine Woods, and the state



Bowater's gate near Sebomook Lake

enjoys a longstanding tradition of public recreational use of privately-owned land. Historically, these uses have been low impact, dispersed activities which were generally compatible with the forest resource and its use for fiber production. More information on recreation and associated issues is provided in the Recreational Resources section of this plan.

Other Values of the Forest

While uses of the forest resource have diversified and to some degree intensified, appreciation of the resource's value independent of its economic and other uses has also grown. Biological diversity, or biodiversity, is a new, emerging value associated with the forest resource. Biodiversity refers to all forms of life (animals, plants, and microorganisms) at all levels of organization (genes, species, and ecosystems). There is increasing interest in maintaining a diversity of species and ecosystems across the landscape to preserve genetic diversity and important functions played by natural systems.

The northern forest maintains biodiversity through the different types of ecosystems it encompasses, ranging from forested wetlands to upland forests; the many species of animals, plants and microorganisms that make up the ecosystems; and the multitude of genes that comprise the organisms. Some advocates of biodiversity are concerned that timber harvesting practiced on a large scale disrupts ecosystems and reduces biological diversity. Impacts depend upon the following factors: the size of the disturbed area; the size, shape and distribution of undisturbed fragments and the extent to which they are interconnected; the presence of undisturbed habitat to serve as source pools for recolonization of disturbed areas; and the amount of time allowed for the disturbed areas to recover.

Since it is logistically impossible as well as impractical to attempt to conserve each element of these systems individually, the trend in maintaining biodiversity involves protection of a representative array of ecosystems well-distributed across the landscape. New approaches to forest management have been proposed which incorporate this

and other concepts designed to maintain substantial levels of wood production while preserving biological diversity. While many of these approaches remain theoretical, trials of some have begun in Maine.

The Maine Council on Sustainable Forest Management, created by the Governor in 1995, is a complementary effort. Tasked with developing "practical, credible benchmarks of sustainability against which forest landowners can assess their forest management practices," the Council has the potential to influence the future biological productivity and diversity of Maine's forests. The Forest Biodiversity Project is a similar effort, initiated in 1994 by public and private landowners, the scientific community, and conservationists to protect biological diversity on Maine's forest lands.

LURC Regulatory Approach

Reasonable regulation of forest practices in environmentally sensitive areas is a high priority of the Commission. The purpose of this regulation is to minimize adverse effects on water quality, fisheries, wildlife, and aesthetic and recreational values while allowing for economic utilization of the forest resource.

The Commission's regulation of timber harvesting and related uses is statutorily limited to zoned protection and development subdistricts, although the statute requires land management roads in management subdistricts to be built and maintained according to road guidelines adopted by the Commission. In most protection zones, the Commission prescribes specific performance standards for harvesting and road-building activities in order to preserve water quality, recreational, and aesthetic values. Where landowners have reason to exceed these standards, they may apply for a permit from the Commission to do so. A permit is required for all harvesting and related activities in zoned development subdistricts.

The most common zoning designation of forestland is the General Management (M-GN) Subdistrict. The General Management zone is intended to enable forestry and agriculture to occur with minimal interference from unrelated development in areas where the resource protection afforded by protection subdistricts is not necessary.

The Commission's standards establish two other management subdistricts which are appropriate for forestland: the Natural Character (M-NC) and Highly Productive (M-HP) Management zones. Neither of these zones have been used yet.

The Natural Character Management zone was designed to maintain the character of certain large undeveloped areas of the jurisdiction and to promote their use primarily for forest and agricultural management activities and primitive recreation. As in the M-GN zone, forest management, including land management roads, is exempt from regulation in the M-NC zone. But whereas the M-GN zone allows residential dwellings of any size, M-NC zones require dwellings to meet the criteria for remote camps, which includes a building size limitation and a prohibition on utilities. Campgrounds, mineral extraction, buildings relating to forestry and agricultural management are allowed in the district, and public utilities are allowed by special exception.

The Highly Productive zone was designed to prevent highly productive agricultural and forestlands from being lost to other incompatible uses. This zone has not been applied to forestland due to the difficulty of defining qualifying lands, but the Commission remains committed to maintaining prime and other important agricultural and forestlands.

A considerable amount of forestland, about 185,000 acres, is in the Fish and Wildlife Protection (P-FW) Subdistrict because it provides habitat for wintering deer. The deeryard protection program is discussed in greater detail in the section on Fish and Wildlife Resources.

The Commission's approach to forestry regulation is perhaps unique in the United States. Tailored to the circumstances of the jurisdiction, this framework provides protection in sensitive areas while allowing for a substantial degree of discretion and flexibility by landowners in managing the bulk of their land for timber production.

The overall approach to zoning of forestland is sound, but there continue to be issues which bear attention. As areas in the General Management (M-GN) Subdistrict continue to be rezoned to development, the M-GN zone has come to be viewed by some as a holding zone for land that is appropriate for conversion to other uses. One approach to addressing this trend is to consider measures which will limit conversion of land most appropriate for resource-based uses and direct development away from these areas.

Forest Resource Issues

The extensive forest resource of the jurisdiction has many diverse values, ranging from timber production to recreation to remoteness. In many



Lots for sale

ways, this resource has been maintained by circumstances of ownership, access, and other factors. These circumstances were likely as important as LURC policies in determining how the forest has been used. Recent decades have brought changes which may reduce this de facto protection of the forest and its myriad values.

As the Northern Forest Lands Council stated in its final report, "The conditions which up to now have conserved the Northern Forest can no longer ensure its perpetuation. The forces for change and current problems... may be stronger or weaker depending on economic cycles, but over the long run they will bring about change that, if left to proceed on its own, is likely to damage both the forest and the people who live there."

Fragmentation of Forest Ownership

A potential threat to forest resources is fragmentation of forest ownership and associated changes in use and management of the forest. Fragmentation of forest ownership is used here to describe land sales that incrementally result in forestlands comprised of smaller lots and more owners.

Many of the jurisdiction's values are closely linked to forest resources, including large-scale commercial forestry, ecological diversity, and recreation in a remote setting. Stability of ownership and dominance of large, landscape-scale parcels are most compatible with these values. Fragmentation of ownership and associated changes in use and management threaten to undermine the integrity of the forest resource in a way that compromises these values.

An unprecedented amount of forestland changed hands during the 1980's. Some of the transactions involved large landholdings, such as the Diamond Occidental lands, and the Great Northern lands (sold twice in a three-year period). These land transactions were unsettling to many because they came at a time when forestland was being viewed, for the first time, as an increasingly valuable commodity for nonforestry uses. Much of this land was ultimately purchased for forestry use – the Great Northern lands, for example – but some of these transactions have resulted in the sale of lands for recreational lots. Portions of the Diamond lands have been sold for these purposes. Ultimately, the large amount of acreage changing hands and increasing use of land for development

in parts of the jurisdiction shook the traditional vision of the region as an area of stable ownership and land use patterns.

The North Woods have experienced periods of active land trading and speculation in the past, but this trading has always involved large parcels of land. More recent land transactions have included the creation of many smaller parcels, making size a potentially limiting factor in the future use of these lands for forest management purposes.

Between 1971 and 1991, the number of landowners owning less than 500 acres increased significantly and an estimated 193,000 acres of land were subdivided from large ownerships into large lots (40 to 500 acres). In 1991, there were nearly 4,200 lots of between 10 and 500 acres, totalling 320,000 acres, within the unorganized townships (i.e. not including the 40 plantations and organized towns also within LURC's jurisdiction).

As lot sizes decrease, the likelihood that owners will manage land for commercial forestry decreases. Some parcels become too small to operate commercially, and some small landowners are not interested in commercial forest harvesting. When small parcels are managed for timber, productivity typically declines between 33% and 66% due to the lack or discontinuity of sound forest management practices.

A 1991 survey of small woodland owners in Maine confirms this notion, finding that respondents with more woodland acres were more likely to harvest timber for sale and to follow a plan or schedule for growing and harvesting timber. This leads to the complementary conclusion that smaller ownerships are less likely to be actively managed for timber. In short, as ownership becomes increasingly fragmented and parcel sizes decrease, some land is effectively removed from commercial timber production and productivity is reduced on others.

It is estimated that at least 56,000 to 105,000 acres of forestland have been removed from commercial forest management since LURC was established. While this amount is small in relation to the total amount of land remaining in forest management, it is a noteworthy trend. Maine's volume of spruce, fir, and quality hardwood has declined, and with future demand likely to be high, loss of forestland for timber production and reductions in productivity are a legitimate concern.

Of equal concern is that land divided into smaller lots becomes more ripe for development –

whether that is the original intent of the division or not. The 1980's demonstrated that there is a high level of interest in seasonal housing in remote regions of the state. Demographics, changes in recreational preferences, and improvements in the economy will likely increase the demand for residential and recreational lots. This interest, and the resulting disparity between the value of land for forestry and its value for development, will continue to serve as an powerful economic incentive for converting high value lands to development.

While isolated hunting camps have coexisted with forestry for many years, more broad-based residential development is not as compatible with industrial forest activities such as aerial spraying and heavy truck transport on logging roads. New residential areas within or near commercial forestlands increase the potential for conflicts between uses. The term "shadow conversion" is used to describe the effect residential development tends to have on adjacent woodlands, often forcing commercial forest activities to be curtailed or modified.

In the past, landowner objectives and the market have limited land conversion in the heart of the jurisdiction as much or more than LURC policies. Many large landowners have chosen not to pursue development on their lands because of tax policies, potential for conflicts of uses, and other disincentives. However, times have changed, as have landowners and their objectives, tax policies, and other factors influencing land use patterns. These factors should not be relied on to preserve the traditional form of the forest and associated values.

There is continuing debate regarding the extent of fragmentation that has taken place and the degree to which it poses a threat. The Commission believes that in selected areas, fragmentation of ownership has negatively affected forest productivity and resulted in some undesirable development. But the Commission's primary concern is the longer-term threat posed by a continuation of this trend, and the Commission believes that now is the time to address this issue with clear policies and actions.

The Commission's goal is to maintain the forest resource in a way that preserves its important values, including large-scale commercial forestry, ecological diversity, and recreation in a remote setting. It will pursue this goal on several fronts. As outlined in greater detail in Chapter 4, the Commission proposes to seek legislative reconsideration of the statutory exemption for 40-acre lots to



eliminate its use for development purposes. It also proposes new development policies to guide future growth to appropriate areas, with specific implementation measures to be developed through a collaborative effort. Finally, the Commission will seek to encourage conservation of select areas of the jurisdiction that are particularly representative of the jurisdiction's principal values and, overall, are especially valued for their remote and relatively undeveloped condition.

Conflicts Between Uses

As use and ownership of the forest diversifies, the potential for conflicts between uses increases. Each user group has different, sometimes conflicting ideas of how the forest resource should be used. Those pursuing recreational development may object to certain forest management practices; those pursuing low-impact recreation may object to the use of the forest for more intensive recreational development.

The M-GN zone, as presently structured, assumes that many activities can co-exist without adversely affecting each other or the forest resource. The effectiveness of the zone will be re-

examined in light of the increasingly diverse and intensive uses of the forest. For this reexamination, the Commission will formulate a strategy for identifying what uses are most compatible with the district's primary purpose – permitting forestry and agricultural management activities with minimal interference. The Commission will identify recreation activities that are compatible with forestry and other traditional uses and promote those in the North Woods. Development which commits land irrevocably to other uses and detracts from the forest resource will be directed to locations where it will not significantly affect this valuable economic and recreational resource. Management for multiple use, which calls for the most judicious use of the resource for a variety of compatible purposes, will be encouraged whenever possible.

Insect and Disease Outbreaks

Maine's forest resources have been affected by outbreaks of insects and diseases as long as they have existed. While the recurring spruce budworm is the most obvious example, other, less predictable natural threats also have noteworthy effects, such as the beech fungus and the hemlock

looper. The Commission developed a number of specific responses to the spruce budworm outbreak of the 1970's and 1980's. The Commission may draw upon these responses in the future as needed to address future natural threats that cannot be predicted.

3

Forest Practices

LURC's forestry standards have proven to be generally sound, but problems have arisen in the practical administration of some of the Commission's standards. In 1984, the Commission established a Forestry Issues Committee to review LURC's forestry regulations and to recommend possible improvements to them. Overall, the Committee found the Commission's forestry regulations to be fundamentally sound, but made a number of recommendations. Some of the recommendations have been implemented. The small streams mapping project was completed, in which additional small streams were mapped using aerial photography and information provided by landowners that wished to participate. LURC road and water crossing standards were revised to clarify which engineering formulae are acceptable for sizing culverts and bridges. Also, enforcement of the Commission's standards has improved dramatically due to the establishment of regional field offices, an increase in LURC enforcement personnel, and adoption of joint enforcement agreements with other agencies, including the Maine Forest Service.

A number of recommendations have not been implemented, in most cases because they involve complex technical or scientific issues which have not been easy to resolve. Many of these issues revolve around the technical capability to evaluate the impact of timber harvesting on water quality. Despite efforts to work with the academic community on these issues, practical approaches to monitoring and evaluating water quality remain elusive. Nonetheless, the enforcement staff has found ways to fairly evaluate impacts on water quality and effectively enforce LURC standards designed to protect valuable natural resources. The Commission will continue to consider the Forestry Issues Committee's recommendations in the context of changing circumstances and priorities and will take action to implement them as needed.

The Commission monitors a number of forest practices issues including the effects of forest practices on water quality and recreation; the possible long-term ecological effects resulting from pesticide and herbicide applications; the effects of

large harvesting machinery on soil compaction and erosion; the effects of whole tree utilization on soil nutrients and subsequent tree growth; the impacts of increased accessibility to previously remote and fragile areas; and the effects of forest practices on wildlife habitats, steep slopes and high mountain areas. The Commission will continue to monitor these issues and adhere to a course of reasonable regulation in a manner consistent with its statutory mandate in order to prevent undue adverse impacts of forestry practices.

Sludge Spreading

Toward the end of the 1980's, the practice of landspreading paper mill sludge began to increase as a more economical alternative to landfilling the material. As the practice increased, so did public concern over the possibility that landspreading might adversely affect ground and surface water, wildlife, and other natural resources. Limited research has been undertaken on the effects of landspreading paper mill sludge.

A considerable amount of the landspreading of paper mill sludge takes place in LURC jurisdiction. Following a public hearing on this issue, in 1989 the Commission adopted rule changes which allow land application of residuals in Management districts without a LURC permit, provided such land application complies with the regulations of the Department of Environmental Protection (DEP). The Commission adopted these rule changes with the understanding that it will reconsider the issue upon conclusion of a "Comprehensive Research Program" on land application of residuals. DEP required industry to undertake this research program as a condition of its landspreading permits and established a Research Advisory Committee to review the research, ensure that it met the highest scientific standards, and was complete, unbiased, and verifiable.

The sludge research program has not produced usable results and the Research Advisory Committee dissolved due to dissatisfaction with the research program's methods and progress. DEP continues to review applications to landspread residuals under its regulations in the absence of comprehensive information about the environmental and public health risks posed by repeated, long-term applications of sludge to the same forestland and farmland. The Commission is concerned about the scientific uncertainty surrounding the effects of this practice, especially since most landspreading occurs on forestland within its juris-

diction. Consequently, it will continue to advocate more study of the issue and will consider limiting this practice if it appears that potential risks cannot be controlled and the risks associated with this practice clearly outweigh the benefits.

Other Policy Initiatives

Northern Forest Lands Study

In 1990, Congress established the Northern Forest Lands Council to seek ways for Maine, New Hampshire, Vermont, and New York to maintain the "traditional patterns of land ownership and use" of the Northern Forests. Following extensive study, the Council determined that the conditions which have conserved the Northern Forest in the past can no longer be relied upon to ensure its perpetuation. In its final report, the council identified a number of problems and forces for change that are affecting the Northern Forest, including:

- Rising taxes, causing loss of land from natural resource uses.
 - Pressure for development of high-value areas near shorelines and scenic places.
 - Jobs lost to competition from other regions and countries, and, thus, taken away from the north country.
 - Incomplete knowledge of land management techniques to maintain or enhance biological resource diversity.
 - Lack of funding and clear priority-setting for public land and easement acquisition.
 - Insufficient attention to and funding for public land management.
 - Fear of losing public recreational opportunities and access to private lands.
 - Failure to consider forestland as a whole, as an integrated landscape.
 - Increased polarization among forest user groups.
- Changing local, state, and federal tax policies to encourage long-term ownership and management, in particular property taxes, estate taxes, capital gains taxes, and passive loss rules.
 - Stronger support for public land acquisition and management that incorporates a careful planning process, and consideration of other tools to protect important public values.
 - Encouraging assessment of the status of biodiversity in each state and development of a process for conserving and enhancing biodiversity across the landscape.
 - Stronger support for public and private initiatives that enable landowners to keep their land open and available for recreation, including a federal excise tax on recreation equipment to help fund these programs.
 - Further study of forest practices and appropriate action to promote sound forest management practices.
 - More technical and financial assistance for private landowners interested in allowing public use of their land for recreation and noncommodity use.
 - Stronger support, in the form of increased funding and educational and technical assistance, for wood products market development, and rural development related to forestry.
 - Review of government regulations to promote simplification and stabilization of the regulatory process.
 - Improved information-gathering, particularly that pertaining to identification of land conversion trends.

The Council proposed a strategy that focuses on strengthening the forest-based economy, fostering long-term stewardship of private land, allowing for public acquisition of land with exceptional public values where those values are threatened, and enhancing management of public land. The Council's major recommendations include:

One specific recommendation regarding land use planning is noteworthy: "Agencies and organizations involved with land use planning should review their existing programs and plans. They should assess them for adequacy in guiding development to appropriate areas, and in supporting traditional uses of the forest."

The Commission is generally supportive of these recommendations as they are complementary of the Commission's goals and policies contained herein.

year-round dwellings by more than a 2-to-1 margin. Most seasonal residents are from Maine, although a significant percentage come from Massachusetts and other Northeastern states.

The median age of jurisdiction residents is nearly 37 years old, compared with 34 for the state as a whole. Thirty-five percent of the jurisdiction's households had incomes in 1990 of less than \$15,000, and the median income was \$21,246, compared to the state median of \$27,896. The average size of year-round households is 2.62 persons, down from 2.89 in 1980.

The population of the jurisdiction is expected to continue its slow growth into the next century, with a majority of new residents settling in the Central and Western Mountain areas. The most significant demographic shift will occur in the population of Maine as a whole, and in other New England states, as the baby boom generation moves into middle age and beyond. Members of these older groups are much more likely to purchase second homes, and the jurisdiction will be an attractive market.

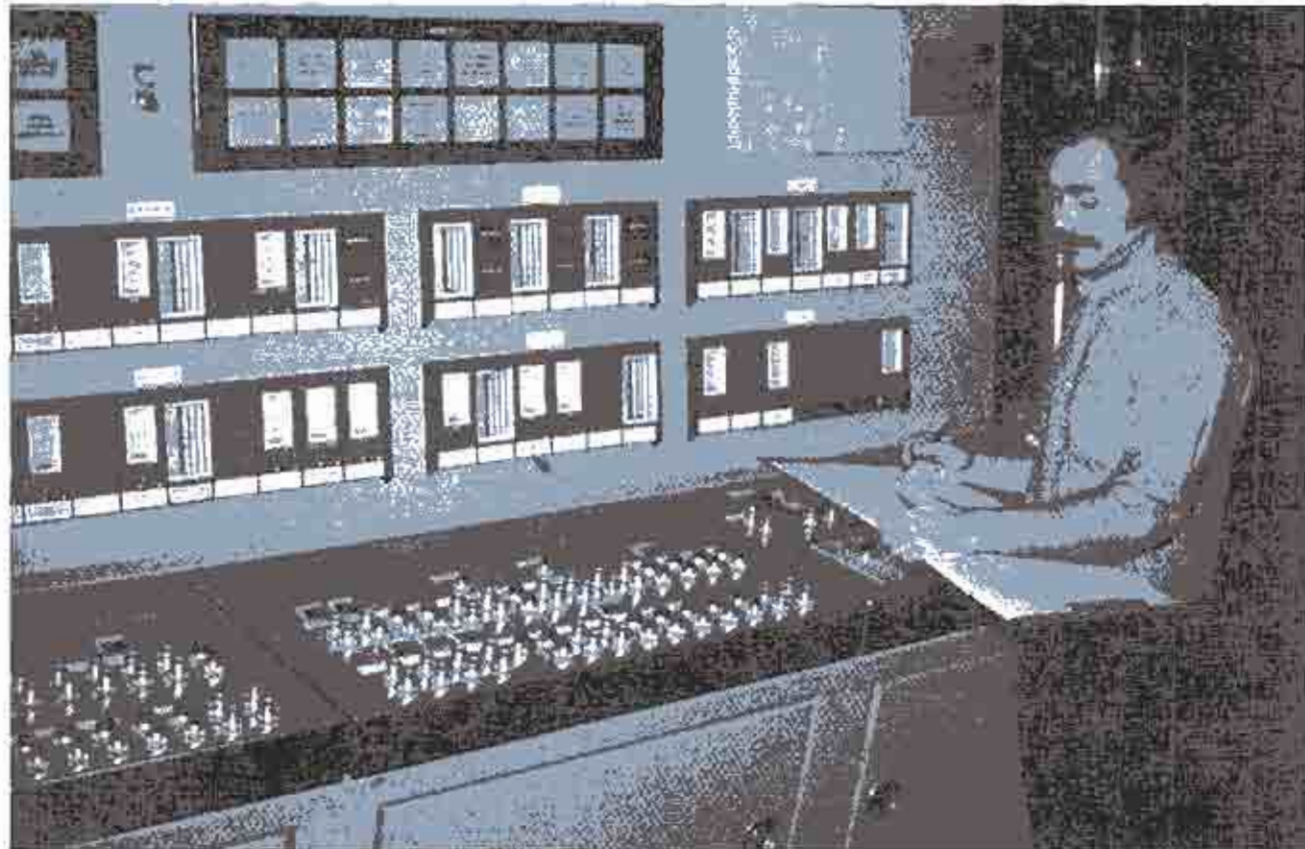
Economy

Primary Industries

The economy of the jurisdiction remains natural resource-based, with a focus on forest products and recreation. Many businesses located outside the jurisdiction depend on its natural resources, either for raw materials or as a destination for recreational activities.

The forest products industry is the largest single contributor to Maine's economy, and is the backbone of the economy of the jurisdiction. The area provides a continuous stream of raw materials for lumber and paper production. Chipping mills, sawmills, and pulp and paper mills of various sizes and types are scattered across the jurisdiction or are located in adjacent towns where they provide employment. Small, specialty wood products manufacturers contribute to the mix.

In the early 1990's, forest-based manufacturing statewide employed over 25,000 people, with a



Paper mill worker

total payroll of over \$660 million. The State Planning Office projects the lumber and wood products sector will increase its employment slowly during the 1990's. Employment in the paper industry is expected to continue a long-term, slow decline.

Tourism and recreation are the next most significant economic force in the jurisdiction. The area's natural resources attract a diverse clientele which spends dollars directly on recreational activities and on support services such as lodging, food and supplies. Facilities such as ski areas, rafting bases, sporting camps, and campgrounds are major tourist attractions, but many recreational users engage in dispersed activities, either on their own or as part of organized tours. Of these types of activities, hunting and fishing have historically generated substantial economic benefit to local communities. More recently, snowmobiling has become a significant job and revenue producer during the winter months. A rapidly growing sector is nature-based tourism – organized or independent activities focused on wildlife viewing, backcountry trekking and other remote recreational experiences.

In the early 1990's, forest-based recreation employed over 24,000 people, with a total payroll of over \$220 million. Evidence of growth in many recreational activities exists within the jurisdiction, but most available information on the tourism sector includes both organized and unorganized areas. The State Planning Office projects jobs in recreational services to grow by 15%- 20% over the course of the decade.

Agriculture is an important economic activity for some portions of the jurisdiction, particularly in Aroostook County and Downeast. Potatoes and blueberries are primary cash crops. On several coastal islands, fishing remains an economic mainstay.

Labor Force and Employment

Some communities of the jurisdiction have diverse local economies based on forest products, agriculture, and recreation. Most residents of the area, however, rely on adjacent organized towns for employment. In 1990, over 75% of the jurisdiction's 5,020 employed residents commuted to organized towns and cities to work, with one-third commuting more than 30 minutes.

The major job centers to which jurisdiction residents commuted for work in 1990 included:

- Four primarily manufacturing communities employing 530 residents: Millinocket (paper), Baileyville (paper and wood products), Houlton (wood products and food related manufacturing), and Caribou (electronics and food);
- Three primarily retail and service centers employing 206 residents: Bangor, Calais, and Van Buren;
- Three recreational communities employing 318 residents: Bethel, Rangeley, and Greenville; and
- Limestone, home of the former Loring Air Force Base, employing 139 residents (many of these jobs have since been eliminated as a result of the base closing).

These 11 communities account for about one quarter of the employment in the jurisdiction.

The future of the economic base that employs jurisdiction residents will be affected by many circumstances, but most notably by the health of the forest products and recreation industries, the closing of Loring Air Force Base and whether a future use is found for the site, and developments in U.S./Canadian trade.

Factors Driving Development

Historically, a major factor contributing to limited development in the jurisdiction has been the policies of large landowners. Many were generally not favorably inclined toward development because education and other costs associated with servicing new development raised property taxes, and development sometimes interfered with forestry operations. In addition, current use taxation of forestland has provided incentives for keeping land in forest management and disincentives for developing land.

But some of the considerations involved in corporate decision-making are changing. The increase in the value of land, particularly along accessible lakefronts, has made development a more attractive alternative, especially as a way to earn a relatively quick cash return compared to the long-term benefits of holding forestland. Increases in estate taxes, and other shifting tax and regulatory policies, have also created uncertainties for long-term investment in forestland.

The effects of these and other changes is that large landowners appear to be more willing to sell

land, and the trend seems to be more toward selling than the past practice of leasing, in which the landowner retained a measure of control. Waterfront lands with potentially high market values are most likely to be sold.

The primary demand for new development will come from the second home market. The fastest growing age category in the primary market area (Maine and Massachusetts) is the 45-54 year-old group, which is also the group most likely to buy second homes. Other factors that will spur the second home market are the relative affordability and availability of land, and improved accessibility within the jurisdiction. These factors are likely to offset the factors of slow population growth and a sluggish economy. Housing projections based on these factors are discussed in the next section.

Primary Development Activities

The primary development activities in the jurisdiction are housing, recreation-related commercial development, energy generating and transmission facilities, other commercial and industrial activities, road and infrastructure improvements, and waste disposal facilities.

Housing

Characteristics

The main type of structural development in the jurisdiction today is housing. U.S. Census data for 1990 show 16,330 housing units. While the average density of housing units within the jurisdiction is exceedingly low (approximately one unit/square mile), concentrations of residential development are found in the plantations and near organized towns.

Residential development typically includes the construction of dwellings, garages, and driveways and/or roads; the clearing and grading of land; and the installation of water and septic systems and utilities. It can also include the construction of other accessory buildings, the installation of docks and communications equipment, and shoreline alteration.

Seasonal homes in the jurisdiction outnumber year-round homes by a more than two-to-one margin. In 1990, the Census classified 5,085 dwellings as year-round residences and 11,244 as seasonal or recreational homes. More than 81% of year-

round and seasonal residences were classified as single-family homes, 16% as mobile homes, and 3% as "other."

Year-round homes are generally located in fringe areas, particularly near employment centers. More than 75% of the employed residents of the jurisdiction commute to work in organized areas. A majority of seasonal homes are also located on fringe areas, most commonly on larger, accessible lakes.

The thirty-two plantations and eight organized towns of the jurisdiction contain a disproportionate share of the housing development. This seems to be a function more of their general location on the fringes of the jurisdiction rather than their governmental status. Many of the unorganized townships on the fringe of the jurisdiction also have relatively high concentrations of housing.

Although recent development has reduced the average age of housing stock in the jurisdiction, a significant percentage of the dwellings were constructed prior to 1960. Most of these structures were constructed as relatively primitive cottages or cabins, and they frequently are sited close to shorelines or roads. Some of these structures remain in their original state, but many have been improved or expanded.

Trends

Housing growth since the inception of LURC in 1971 has been moderate. Between 1971 and 1991, the Commission issued 5,046 permits for new dwelling units, an increase of 40% in housing stock, using the estimated 1970 Census count of 12,634 dwellings as a baseline. During this same period, the Commission approved 144 subdivisions, accounting for 1,820 new lots occupying 6,375 acres.

The 1990 Census data indicate 3,696 new dwellings in the 1970-90 period. This disparity between permit and Census data is probably the result of not all permitted dwellings being constructed as of April 1990, when Census counts were taken, and possible undercounting by the Census of vacant seasonal housing on unimproved roads or isolated camps with no road access.

While housing growth, averaged over the period between 1971 and 1991, was moderate, housing growth during the 1980's was brisk. According to Census information, 3,079 dwellings were constructed during the 1980's, a rate of over

the Commission's ability to provide on-site assistance and ensure compliance with its standards, and create new educational opportunities.

A comprehensive lakes management program was developed following years of inventory and study of 1,500 lakes in LURC jurisdiction. In 1990, this program was implemented through adoption of a lake classification and management program designed to guide development to suitable lake locations and away from inappropriate locations. Legislation was subsequently passed in 1992 establishing the Great Pond Task Force. Among its charges was a directive to develop a great pond classification system for the rest of the state which was to be consistent with the Commission's classification system.

A comprehensive review of the deer wintering area program was completed and changes to the program were adopted in 1991. The fundamental structure and function of the program was unaltered, but the program was improved by defining its scope and improving the basis for decision-making.

In 1991, comprehensive metallic mineral mining rules were adopted jointly with DEP. They included technical rules pertaining to exploration and mining activities and revisions to the Standards which allow the rezoning of areas associated with mining activities.

In 1992, *A Guide to Creative Site Planning in the Unorganized Areas of Maine* was prepared to provide pre-application guidance on site/development design to those persons who intend to subdivide and develop land in the Commission's jurisdiction.

A number of special resource protection plans have been developed jointly with landowners to both meet the resource protection objectives of the Commission and provide a maximum amount of land management flexibility for landowners. These include resource plans for Dix Island (1977), Hewett Island (1978), Penobscot River (1981), St. John River (1982, renewed 1992), White Mountain National Forest (1982, renewed 1992), and Metinic Island (1992, 1994).

In 1993, the first concept plan was approved for a 17,000-acre area in Attean Township and Dennistown Plantation. This plan received the planning project of the year

award from the Maine Association of Planners. The concept plan is an innovation that fulfills the Commission's goals of encouraging landowner-initiated, long-range, natural resource-based planning as an alternative to incremental development.

- Planning assistance has been provided to 10 plantations or towns that were originally within the Commission's jurisdiction so that they could prepare their own plans and regulations to be administered locally. The Commission also worked with residents of the deorganized towns of Benedicta and Greenfield to prepare zoning maps for these townships when they entered the Commission's jurisdiction. The maps serve as the basis for Commission decision making in those townships.
- Planning assistance was also provided to Monhegan Plantation in 1991 to prepare a land use and natural resource inventory and analysis report to assist the Commission and Plantation officials in carrying out their respective responsibilities for that community. Commission staff also assisted Monhegan in applying for and receiving a grant to improve public facilities on the Island.
- In 1994, the Commission developed conservation easement holder guidelines and a model conservation easement to serve as the basis for easements that may come before the Commission for approval as part of regulatory actions.
- Each year, the Commission has acted upon hundreds of applications for development and other land use activities, approving the vast majority (over 90%). These permits are often approved with special conditions to prevent environmental degradation.

As evidenced by its history of accomplishment, the Commission's focus has shifted over the years in response to changing needs and new challenges. In its first decade, the Commission developed a planning and zoning framework for the unorganized areas, implemented interim zoning over its jurisdiction, and established its major natural resource and development policies. In its second decade, with its regulatory framework in place, the Commission turned to fine-tuning its standards and addressing emerging issues. The major issues of this period were the spruce budworm outbreak, debate over conservation versus

use of rivers, and, in the latter years, significant changes in the amount and nature of development activity occurring in the jurisdiction.

The surge in development activity associated with the land and real estate boom of the late 1980's commanded the Commission's attention in the early 1990's. Even though the real estate boom has subsided, it highlighted changes in the forces affecting land and resource use in the region since the Commission was created in 1971. Demand for residential development is continuing at a steady rate, corporate priorities and forestry operations are changing, and land ownership patterns are shifting.

An unprecedented amount of forestland changed hands during this period. These land transactions were especially of concern because they came at a time when forestland was being viewed, for the first time, as an increasingly valuable commodity for nonforestry uses. Even though much of the acreage remained in forestry use, the

growing volume of land transactions and increase in use of land for development rather than forestry purposes shook the traditional vision of the region as one of stable ownership and land use patterns.

The jurisdiction has experienced periods of active land trading and speculation in the past, but these transactions always involved large parcels of land, the future use of which was not limited or pre-disposed by size. The real estate boom of the late 1980's included many smaller parcels, use of which is more limited, with significant implications for future land use patterns.

The 1980's indicated that there is a high level of interest in land and housing in remote regions of the state. This interest has continued to manifest itself in the form of continued development proposals into the 1990's. The Commission's review of development proposals in the early 1990's has been dominated by questions of appropriateness in terms of location, scale, and relation to existing uses and resources.

D. Cultural, Archaeological and Historical Resources (issue discussion page 37)

Goal: Protect and enhance archaeological and historical resources of cultural significance.

Policy: Identify and protect unique, rare, and representative cultural resources to preserve their educational, scientific, and social values.

E. Energy Resources (issue discussion page 40)

Goal: Provide for the environmentally sound and socially beneficial utilization of indigenous energy resources where there are not overriding, conflicting public values which require protection.

Policies.

1. Encourage energy conservation and diversification and the use of indigenous renewable resources to increase the state's energy self-sufficiency.
2. Prohibit energy developments and related land uses in areas identified as environmentally sensitive where there are overriding, conflicting environmental and other public values requiring protection.

Permit new energy developments where their need to the people of Maine has been demonstrated and they are sited, constructed and landscaped to minimize intrusion on natural and human resources.

4. Review environmental and social impacts of energy development and establish permit conditions which minimize and mitigate adverse effects of such developments.
5. Prohibit hydropower development on river stretches identified as having overriding recreational or natural values.
6. Encourage development of new, small hydropower projects and reconstruction of existing hydropower projects where these can be undertaken in an environmentally sound manner.
7. Allow new or emerging energy technologies which do not have an undue

adverse impact on existing uses and natural resources.

8. Limit the scale of new or emerging energy technologies where feasible to allow time for the Commission to evaluate the technology and its impacts in large scale applications.

F. Forest Resources (issues discussion page 46)

Goal: Conserve, protect and enhance the forest resources which are essential to the economy of the state as well as to the jurisdiction.

Policies.

1. Discourage development that will interfere unreasonably with continued timber and wood fiber production, as well as primitive outdoor recreation, biodiversity, and remoteness, and support uses that are compatible with these values.
2. Protect areas identified as environmentally sensitive by regulating forestry activities, timber harvesting, and construction of land management roads.
3. Review and make appropriate refinements, from time to time, in forest practice standards for protection districts in order to make such standards effective in minimizing environmental degradation. Standards shall be responsive to the needs of private land management and to the public need for adequate timber resources to support the economic base of the state.
4. Support efforts by landowners to manage vehicular access to private roads when necessary to reduce land use conflicts and protect high value natural resources.
5. Allow harvesting of dead and dying trees resulting from insect or disease outbreaks or other causes, consistent with the Commission's responsibilities for protection of significant natural resource values and uses.
6. Discourage land uses that are not essential to forest management or timber production on highly productive forestlands.
7. Provide an educational program to guide land management, including road

construction, in an environmentally sound manner.

8. Encourage scientific research and management of forest resources in relation to other important resources, including study of the effects of landspreading of sludge.
9. Encourage the use of Maine's best management practices for forestry.

G. Geologic, Mineral and Mountain Resources (issues discussion page 56)

Geologic Resources

Goal: Conserve soil and geological resources by controlling erosion and by protecting areas of significance.

Policies

1. Regulate land uses to protect areas identified as important natural geological formations.
2. Regulate land uses in areas with identified topographical or geological hazards, including areas with fragile soils, steep slopes, high elevations, or seismic faults.
3. Administer standards for structural development and other land uses based on soil suitability.
4. Administer performance standards for timber harvesting, road construction, gravel extraction, stream crossings, agricultural practices and other land use activities in order to control potential causes of accelerated soil erosion.
5. Regulate the disposal of sewage, solid waste, manure, and septic sludge and prohibit their disposal in flood prone areas, on unsuitable soils, or in other inappropriate areas.

Mineral Resources

Goal: Allow environmentally responsible exploration and mining of metallic and non-metallic mineral resources where there are not overriding, conflicting public values which require protection.

Policies.

6. Permit exploration for mineral resources provided no more than minimal distur-

bance is caused to natural and cultural resources.

7. Provide for small sand and gravel extraction operations used primarily for the construction and maintenance of roads in most areas without rezoning, but subject to compliance with performance standards designed to avoid undue environmental harm.
8. Permit larger sand and gravel extraction operations in areas zoned for industrial development where a benefit to the people of Maine has been demonstrated and the operations are sited and developed in a fashion which minimizes adverse effects on other land uses and natural resources.
9. Permit major metallic mining developments only in areas zoned for planned development, and provide a rezoning procedure for this purpose which broadly considers impacts and benefits, competing uses and public values.
10. Regulate mining operations to minimize water, air, land, noise and visual pollution, to ensure public safety and health, and to avoid undue adverse impacts on fisheries, wildlife, botanical, natural, historic, archaeological, recreational, and socioeconomic values.
11. Require effective monitoring and reclamation of mining sites to protect public health and safety and to promote beneficial reuse where feasible.
12. Prohibit excavation of sand and gravel resources below the water table except where it is demonstrated there will be no undue adverse impact to ground water resources.

Mountain Resources

Goal: Conserve and protect the values of high mountain areas from undue adverse impacts.

Policies.

13. Regulate high mountain areas to preserve the natural equilibrium of vegetation, geology, slope, soil, and climate, to reduce danger to public health and safety posed by unstable mountain